

159	<b>WOUND STORAGE PACKAGE</b>	328.1	..Radially shiftable hub component
160.1	.Convolute coil (e.g., wound web)	328.2	..Driven supply coil
160.2	..Plural coils	329	.Winding into coil center
160.3	..Axial retainer (e.g., flange)	329.1	..Having coil hub expander
160.4	..For particular coiled material	330	.Simultaneously driven carriers (e.g., separate optic and sound webs)
163	.Interconvolutionary strand delivery	331	.Intermediate storage (e.g., low inertia bin)
164	.Strand end feature	331.1	..Vacuum column
165	..Strand end forms winding	331.2	...Carrier responsive control
166	.Plural windings	331.3	....Pneumatic pressure controller
167	..Serially connected	331.4	....Photoelectric controller
168	.Distorted winding	331.5	..Having spool or carrier brake control
169	..Spooled	332	.Including threading
170	.Housing or outer peripheral support	332.1	..Having particular automated control
171	..With strand guide	332.2	...Actuated by lead end sensor
172	.Strand restraining or snarl preventing means	332.3	..Having pneumatic assist
173	..Adhesive	332.4	..Having leader gripper or coupling
174	.Particular winding	332.5	..Having rotary extractor (e.g., stripper)
175	..Cone wind	332.6	...Endless belt
176	..On core	332.7	..Having carrier to spool attachment means
177	...Plain cone core	332.8	...Slotted spool
178	...Plain cylinder	333	.Automated stop or reverse
324	<b>UNWINDING AND REWINDING A MACHINE CONVERTIBLE INFORMATION CARRIER (E.G., MAGNETIC TAPE OR PHOTOGRAPHIC FILM)</b>	333.1	..Diverse control signal inputs
324.1	.Carrier helically or randomly wound (e.g., magnetic wire, edge wound film, etc.)	333.2	..Carrier supported signal
324.2	..Cartridge storage	333.3	..Carrier engaging tension sensor
324.3	..Carrier distributor	333.4	...Electrical control
325	.Endless coiled carrier (i.e., closed loop)	333.5	..Coil diameter sensor
325.1	..Wound into superposed coil pair	333.6	..Coil rotation sensor
325.2	..Having carrier responsive control	333.7	...Electrical control
325.3	..Reversible	334	.Carrier speed or tension control
326	..Cartridge storage	334.1	..Plural speeds
326.1	...Insertion responsive component	334.2	..Diverse signal inputs
326.2	...Particular cartridge structure	334.3	...Tachometer-type signal device
326.3	....Coil support	334.4	..Tachometer-type signal device
326.4	....Carrier guide	334.5	..Coil diameter or weight responsive sensor
327	..Particular coil support	334.6	..Carrier tension responsive signal
327.1	...To accommodate convolution speed variations	335	.Cartridge system (i.e., cartridge work station or cartridge)
327.2	...Radial roller	336	..Adaptive or convertible
327.3	...Multiple pulleys or hub rollers	337	..Plural (i.e., multiple cartridges per work station)
327.4	....Cooperating pulley pair	337.1	...Coil to coil
328	.Unwinding from coil center		

338	..With insertion responsive component	355.1	...Radially applied
338.1	...Releasable brake	355.2	....By manual operator
338.2	....With shiftable cover actuator	356	..Alternately or differently driven coils
338.3	....Acting on plural coils	356.1	...Coaxial coils
338.4	...Cartridge positioner	356.2	...Step-driven coil
339	..Cartridge ejector	356.3	...Multiple carrier speeds
340	..With particular drive mechanism	356.4	....With particular manual controller
341	..Coil-to-coil cartridge	356.5	...By friction drive
342	...With particular drive coupling	356.6	....With one-way clutch
343	...With brake or lock	356.7	....Radially acting wheel, disk, or belt
343.1	....Yieldable brake	357	.With detector or indicator (e.g., length scale)
343.2	.....Spool or coil engaging	358	.Particular frame or frame attachment
344	...With indicator or detector	358.1	..Including spool support
345	...With particular coil support	360	<b>LOOP FORMING (E.G., WINDING A BUNDLE OF WIRE COILS)</b>
345.1	....Coaxial coils	361	.By orbital guide
345.2	....Spring pressed coil or spool	361.1	..Simultaneous or successive winding
345.3	....Coil on liner	361.2	..About internal loop form
346	...With particular guide or guard	361.3	...With loop discharge device
346.1	....Shiftably mounted	361.4	..With loop collector
346.2	....Rotatable	361.5	...With loop bundle unloader
347	...With particular housing construction	362	.By rotatably driven loop collector
347.1	....Shiftable closure (e.g., door)	362.1	..Simultaneous or successive winding
347.2	....Separable or hinged sections	362.2	..With loop bundle unloader
348	..Single coil cartridge (e.g., film magazine)	362.3	...Stripper plate or arm
348.1	...With carrier inner end collector	363	.With particular loop or coil transfer mechanism
348.2	...With carrier outer end retainer	364	<b>UNIDIRECTIONAL WINDING AND UNWINDING</b>
348.3	...With means to facilitate unwinding	364.1	.Convolute coil
348.4	...Light occludent	364.11	.Partial wrap around plural rotatable supports
349	.With particular drive	364.12	..Shifting material axially
350	.Manual	364.2	..Distinct supporting surfaces on a support
351	.Nonelectrical motor	364.3	...With radial spacing regulator
352	..Simultaneous drive to supply and take-up coils	364.4	.Threading
352.1	...Each drive a motor	364.5	.Convertible between variable and fixed number of windings on material support
352.2	....With additional linear feed drive motor	364.6	.Variable number of windings on support
352.3	...Coil engaging drive	364.7	..Having material accumulation sensor
352.4	....Endless belt		
352.5	...Multiple carrier speeds		
353	..With yieldable loop former		
354	..Particular linear feeder (e.g., capstan or sprocket)		
354.1	...Plural		
354.2	...With particular manual controller		
355	..With brake or stop		

364.8	...Senses without material contact	236	....With manual actuator to shift guide to unwind position
364.9	..Rotating winding surface	237	.....Actuator forward of rotor
365	...Movable material displacement means (e.g., wobble plate)	238	.....With line snubber shifted by remote actuator
365.1	...Material removed axially from winding surface	239	.....Rotor and snubber shiftable axially
365.2	...Single material strand simultaneously wound into or unwound from plural coils	240	.....Guide shifted radially
		241	...With level-winding mechanism
365.3	..Stationary winding surface (e.g., with flyer)	242	....Eccentric cam reciprocates spool
365.4	...Brake providing resistance to removal of material	243	...With brake
365.5	...Adjustable drum surface (e.g., variable diameter)	244	....Continuously applied
		245	.....Between spool shaft and frame
365.6	..Fixed number of windings on winding surface (e.g., positive feeder)	246	.....Between spool and spool shaft
		247	....Positive
365.7	..Automatic control or regulation of speed of winding surface	248	.....Defines home position of reel part
365.8	..Manually adjustable winding surface speed	249	..With drive mechanism
365.9	..Manual drive	250	...Motor driven
366	..Winding drum details	251	....Spring motor
366.1	...Variable diameter	252	.....Motor actuated in response to pull on line
366.2	..Shifting material axially on support	253	.....With independent manual drive
		254	.....With spring charger
366.3	..Distributing material along the support	255	...Multiple drive ratio
		256	...Ratchet-type drive
366.4	..Particular drive	257	...With disengageable positive drive components (e.g., a clutch)
370	<b>REELING DEVICE</b>		
223	..Fishing rod reel		
224	..Axial unwinding (i.e., spinning reel)	258	....With alternative yieldable mechanism
225	...Motor driven	259	....Axially engaged
226	....Spring motor	260	.....Coaxial of spool
227	...Spool rotatable to wind	261	.....Reengageable responsive to drive rotation
228	....With guide shiftable between wind and unwind positions	262	....Reengageable responsive to drive rotation
229	....Spool pivotal between wind and unwind positions	263	....Gear pair
230	...With winding guide on rotor rearward of spool	264	...With yieldable drive coupling (e.g., friction or fluid clutch)
231	....Guide shiftable on rotor		
232	.....Guide shifted to wind position by rotor drive	265	....Variable by crank manipulation
233	.....Guide shifted to unwind position by discrete manual operator	266	....Variable within distinct range(s)
		267	....Between drive shaft and crank
234	...With winding guide on rotor forward of spool	268	....Between drive shaft and gear
		269	....Coaxial with line take-up
235	....Rotor drive shifts guide to unwind and wind positions	270	.....Axially applied
		271	.....By center pin
		272	...With feed roller

273	...With level winding	314	....Rotated joint
274	....Line shifts along rotatable cam bar	315	.....Threaded
275	....Line traction guide wheel	316	...Reel support (e.g., reel foot)
276	....Manually shifted guide	317	...Stub shaft support
277	....Drive mechanism oscillates guide	318	....With spool retainer feature
278	....Drive mechanism reciprocates guide	319	...With line or water shield
279	.....Reversely threaded screw	320	...With lubrication feature
280	.....Guide shiftable between wind and unwind positions	321	...With bearing feature
281	.....Guide has line removal opening	322	..Spool or spool shaft feature
282	...Alternative right or left side drive	323	..Reel attachment
283	...Hand crank feature	371	..With spring motor
284	....Collapsible or extensible	372	..Plural springs
285	..With brake	373	..Spring exhibits special torque characteristic
286	...Unwinding speed regulator (e.g., anti-backlash brake)	374	..With auxiliary force rewinding
287	....Line tension responsive actuator	375	..Spring attachment
288	....Magnetic	375.1	...Spring force adjustment
289	....Centrifugal	375.2	...Pretensioned spring attachment
290	...Spool bearing brake	375.3	...With transmission
291	...Manual pressure control	376	..Particular spool structure
292	....Radially applied	376.1	...Particular bearing
293	.....Rolling contact	377	..Particular guide structure
294	.....Separable attachment	378	..Multiple windings
295	...Connected to spool by one-way clutch	378.1	...Of centrally gripped material
296	...Adjustable pressure pawl (e.g., braking clicker)	378.2	....End segment anchored
297	...Positive	378.3	.....Material supported spool
298	....One-way	378.4	...On independent spools
299	.....With disabler	379	..Particular frame or frame carrier
300	.....Rotation responsive	379.1	...Energy or stress absorption structure
301	...Radially engaged	379.2	...Frame carrier feature
302	...Axially engaged	380	..Material irregularity (e.g., knot) engageable with stop
303	....Coaxial with spool	381	..Yieldable brake (e.g., friction or fluid)
304	....On adjustable lever	381.1	...Material engaging
305	..With unwinding indicator (e.g., bell or flashing light)	381.2	....Engages wound material
306	...Clicking indicator (e.g., flexible pawl and toothed member)	381.3	....Manually operated
307	...Spring biased pawl	381.4	....Tension responsive
308	....Plural spring sections	381.5	...Centrifugal
309	..With line unwinding limiter	381.6	...Manually operated
310	...Frame or static component	382	..Lock against spool unwinding
311	...Spinning reel frame	382.1	...Material responsive (e.g., automatic lock)
312	...Frame disassembly feature	382.2	....Convertible to emergency locking
313	....Hinged frame section	382.3	....Time delay
		382.4	....Predetermined length of material unwound
		382.5	...Alternately engaged locking pawls
		382.6	...Shiftable spool body

- 383 ...Material speed responsive (e.g., belt sensitive)
- 383.1 ....With lock prevention or sensitivity reduction
- 383.2 ....Inertia operator
- 383.3 .....Axially movable lock
- 383.4 .....Frame mounted locking pawl
- 383.5 .....Opposed pawls on spool
- 384 ...Frame movement responsive (e.g., vehicle sensitive)
- 384.1 ....With lock prevention or sensitivity reduction
- 384.2 ....With pivot pawl
- 384.3 ....Axially movable lock member
- 384.4 ....Multiply positionable operator
- 384.5 ....Pendulum operator
- 384.6 ....Ball operator
- 384.7 ...Manually operated
- 385 ..Lock against spool winding
- 385.1 ...Material movement responsive (e.g., window shade type)
- 385.2 ....With additional lock release
- 385.3 ....Movable locking pawl on frame
- 385.4 ...Manually operated
- 386 ..With orbital wrapping guide
- 387 ..Axial unwinding
- 388 ..Multiple windings
- 388.1 ..Of centrally gripped material
- 388.2 ...With material snagging lock (e.g., midline tightener)
- 388.3 ....With unidirectional brake
- 388.4 ....With integrated crank
- 388.5 ...With mounting frame
- 388.6 ..Plural spools or spool portions
- 388.7 ...Alternatively driven
- 388.8 ....Single power source (e.g., clutched spools)
- 388.9 ..Material stored in loops or variable-size coils
- 388.91 ..Plural coils
- 389 ..With particular drive (e.g., ratchet drive, motor drive)
- 390 ..Motor powered
- 390.1 ...With material length stop
- 390.2 ...For unwinding
- 390.3 ....With coil constrainer
- 390.4 ...Weight
- 390.5 ...Fluid
- 390.6 ....With speed or torque control
- 390.7 ...Vehicle motor (e.g., power take-off)
- 390.8 ...Electric
- 390.9 ....With speed or torque control
- 391 ..Traction driven spool (e.g., ground engaging)
- 391.1 ...Spool shiftable clear of traction surface
- 391.2 ...With spool drive transmission
- 391.3 ....Belt or chain
- 392 ..Spool on vehicle wheel or axle
- 393 ..Peripherally driven spool
- 394 ..Releasable spool drive (e.g., clutched spool)
- 394.1 ...Limited torque (e.g., slip coupling)
- 395 ..Manually rotatable crank or wheel
- 395.1 ...Foldable spool drive crank
- 396 ..With brake
- 396.1 ..Positive
- 396.2 ...One-way
- 396.3 ....Reversible
- 396.4 ....Ratchet and radial pawl
- 396.5 ..Friction
- 396.6 ...Applied to coil or spool (e.g., radial)
- 396.7 ....User pressure application
- 396.8 .....Radially applied
- 396.9 ....Axially applied
- 397 ..With particular guide or guard
- 397.1 ..Guide boom or tube
- 397.2 ..Shiftably mounted guide (e.g., material distributor)
- 397.3 ...Driven shifting device (e.g., cam, crank, or screw)
- 397.4 ...Manually operated
- 397.5 ..Rotary guide
- 398 ..With particular frame or frame carrier
- 399 ..Plural spool positions
- 399.1 ...With discrete actuator
- 399.2 ...Arcuately displaced positions
- 400 ..Combined with nonreel device
- 400.1 ...Hand wrapped
- 401 ..Collapsible or knockdown
- 402 ..With material segment retainer
- 403 ..Mobile carrier
- 403.1 ...Single primary axle (e.g., hand cart)
- 404 ..Releasable mounting (e.g., separable fastener)
- 404.1 ...Flexible strap or harness
- 404.2 ...Clamp (e.g., C-clamp)
- 404.3 ...Hook, ring, or hanger
- 405 ..Hand carried
- 405.1 ...Hand wrapped
- 405.2 ....With distinct handle

405.3	...With distinct handle	420	..Supply coil drive control
406	..With special base or mounting member (e.g., attachment socket or stake)	420.1	...Peripheral drive
407	..With particular spool	420.2	....Belt
407.1	..Collapsible or knockdown	420.3	.....Slackness sensor
410	<b>TENSION CONTROL OR BRAKE</b>	420.4	...Clutch
411	..Cyclic material reserve (e.g., irregularly shaped take-up)	420.5	...Electrical control circuit
412	..Take-up coil drive control	420.6	....Slackness sensor
412.1	..With supply control	421	..Supply coil brake control
412.2	...Plural condition sensors (e.g., slack loop sensors)	421.1	...Plural sensors
412.3	....Diverse (e.g., slack loop and diameter sensors)	421.2	...Coil diameter sensor
413	..With material condition sensor	421.3	...Coil weight sensor
413.1	...Plural sensors	421.4	...Speed, torque, or revolutions sensor
413.2	...Coil diameter responsive sensor	421.5	...Slackness sensor
413.3	...Slackness sensor (e.g., photocell or load cell)	421.6	....With power control circuit
413.4	....With power control circuit	421.7	.....Electrical
413.5	.....Electrical	421.8	....Mechanically applied brake
413.6	.....Switch actuated	421.9	.....Compound leverage mechanism
413.7	....Transmission control	422	..Yieldable coil brake
413.8	.....Yieldable drive (e.g., clutch or slip coupling)	422.1	...Plural
413.9	...Speed of running material sensor	422.2	...Fluid or magnetic brake or operator
414	..Power control circuit (e.g., fluid regulating network)	422.3	...Electrical operator
414.1	...Electrical circuit	422.4	...Radially applied
415	..Transmission control	422.5	...Wound material engaging
415.1	...Yieldable drive (e.g., clutch or slip coupling)	422.6	.....Strap
416	..Supply controlled	422.7	.....Accommodates roll transfer
417	..Reserve loop former	422.8	....Strap
417.1	...Pneumatic	422.9	....Opposed
417.2	...Plural loops	423	...Axially applied
417.3	...Yieldable loop former	423.1	....Coaxial with coil
418	..Feeder associated with coil	423.2	.....Opposed
418.1	...Slackness sensor	430	<b>COMPOSITE ARTICLE WINDING</b>
419	..Drag on running material	431	..Controlled by an electrical property of article
419.1	...Slackness sensor	432	..On internally toothed core (e.g., motor stator)
419.2	...Coil diameter sensor	432.1	..By endless, flexible shuttle
419.3	...Pneumatic or magnetic	432.2	..By compound movement mechanism
419.4	...Clamping	432.3	...Shuttle reciprocated
419.5	....Rotary (e.g., pinch pair rollers)	432.4	....And oscillated
419.6	...Successive	432.5	.....With radially shifted guide component
419.7	....Shiftable (e.g., variable tortuous course)	432.6	..Having particular core holder or material guide
419.8	...Rotary	433	..On externally toothed core (e.g., motor armature)
419.9	....With brake or clutch	433.1	..By compound movement mechanism
		433.2	..By rotating core
		433.3	..By orbiting guide
		433.4	..Having particular core holder or material guide
		434	..Through opening in ring-shaped core

- 434.1 ..By supply coil linked with core
- 434.2 ...Supply coil on rigid spool
- 434.3 ....Having material guide  
slidable on spool
- 434.4 ....Having guide ring coaxial  
with spool
- 434.5 ..By supply coil cycling through  
opening
- 434.6 ...Supply coil tangentially  
positioned on a winding  
shuttle
- 434.7 ..By material end cycling through  
opening
- 434.8 ...Multistep cycle
- 434.9 ..Having particular core holder  
or indexing means
- 435 ..On spherical core
- 435.1 ..Core peripherally driven to  
wind
- 435.2 ...By roller
- 436 ..Modified spherical core or  
article
- 437 ..On irregularly shaped core
- 437.1 ..Having curvilinear or offset  
core portions
- 437.2 ...Diverse coils
- 437.3 ...Noncircular core
- 437.4 ...Flattened core
- 438 ..For prestressing core
- 438.1 ..By orbiting material supply
- 439 ..By orbiting material supply
- 439.1 ..Material guide disposed about  
core tip (e.g., terminal  
winder)
- 439.2 ...Motor powered
- 439.3 ....Handheld
- 439.4 ..Simultaneous winding
- 439.5 ...On single core
- 439.6 ....Supply coil coaxial with core
- 440 ..Sequential winding
- 440.1 ...On single core
- 441 ..Having mechanism to distribute  
convolutions
- 441.1 ...Reciprocating
- 441.2 ...Single winding pass
- 441.3 ....Core supports winder
- 441.4 ....Material supply coaxial with  
core
- 442 ..Handheld wrapping tool
- 443 ..By rotating core
- 443.1 ..Simultaneous winding
- 444 ...On single core
- 444.1 ....Dielectric and conductive  
layers (e.g., capacitor)
- 444.2 ....Special web layering (e.g.,  
offset edges)
- 444.3 ....Continuous or semicontinuous  
winding
- 444.4 ....Adjacent helical layers  
(e.g., strand on strand)
- 444.5 ....Web layer wound between  
helical layers
- 445 ..Sequential winding
- 445.1 ...On single core
- 446 ..Having manual drive
- 447 ..Having mechanism for  
distributing convolutions
- 447.1 ...By reciprocating guide or  
supply
- 447.2 ....Threaded operator
- 447.3 ...Single winding pass
- 448 ..Having particular workpiece  
holder
- 448.1 ..Core flexure inhibitor (e.g.,  
for winding onto hose)
- 470 **HELICAL OR RANDOM WINDING OF  
MATERIAL**
- 471 ..For web material
- 472 ..On a hand tool (e.g., tatting  
shuttle or heddle needle)
- 472.1 ..Untwisted fiber bundle (i.e.,  
sliver)
- 472.2 ..Particular traverse of bundle
- 472.3 ..Of twine mass or ball
- 472.4 ..By orbital flyer
- 472.5 ..To form coreless package
- 472.6 ..By orbital flyer
- 472.7 ..On planar form (e.g., card,  
board)
- 472.8 ..Plural distinct strands onto  
single spool (e.g., doubling  
machine)
- 472.9 ..Having material controlled stop
- 473 ...Break or exhaust responsive
- 473.1 ....Separating wound package from  
driver engaging package  
periphery
- 473.2 ...Coil diameter responsive
- 473.3 ....Separating wound package from  
driver engaging package  
periphery
- 473.4 ..Including wound package or empty  
spool handling
- 473.5 ..Removing wound package from or  
loading empty spool onto a  
winding station
- 473.6 ...Carriage-mounted handling  
device

- |       |  |       |  |
|-------|--|-------|--|
| 473.7 | ....Including additional material manipulation                             | 476.5 | ....Including particular material end gripper  |
| 473.8 | ...Including additional material manipulation                              | 476.6 | ..Including particular material end gripper  |
| 473.9 | ...By ejector  | 476.7 | .Distributing material along the package   |
| 474   | ..Loading supply package on or removing empty spool from unwinding station | 476.8 | ..High frequency, low amplitude traverse superposed on low frequency high amplitude traverse |
| 474.1 | ...On a tray with vertical spool support                                   | 476.9 | ..Rotating take-up having radially movable guide   |
| 474.2 | ...Including additional material manipulation                              | 477   | ...Material guide pressed against wound package  |
| 474.3 | .Alternately or sequentially wound spools                                  | 477.1 | ..Preventing package end ridge   |
| 474.4 | ..Spools on parallel spindles  | 477.2 | ...By shifting the traversing stroke of guide  |
| 474.5 | ...Spindles on indexable turret  | 477.3 | ...By varying the traversing speed of guide  |
| 474.6 | ....Coil engaging drive (i.e., peripheral drive)                           | 477.4 | ..Preventing superposed convolutions in successively wound layers (i.e., ribbon breaker)     |
| 474.7 | ...Including particular material snagger                                   | 477.5 | ...By control of guide   |
| 474.8 | ..Coaxial spools   | 477.6 | ....Guide traverse speed   |
| 474.9 | ...On separately driven spindles   | 477.7 | ...By control of take-up   |
| 475   | ....Including particular material snagger                                  | 477.8 | ....Take-up rotational speed   |
| 475.1 | .Joining ends of material (e.g., knotting, splicing)                       | 477.9 | ..Traverse speed dependent on direction of motion  |
| 475.2 | ..On carriage movable between plural winding stations                      | 478   | ..Forming symmetrical layer  |
| 475.3 | ..Plural winding stations movable to fixed position joining means          | 478.1 | ..Stepwise (i.e., orthocyclic)   |
| 475.4 | ..Including particular joining structure or control                        | 478.2 | ..With distribution monitor and correction or indication                                     |
| 475.5 | ..Including inspection or detection of material ends or of joined ends     | 478.3 | ..By relatively reciprocating ring rail having an orbital guide                              |
| 475.6 | ..Including particular material end transfer to joining means              | 478.4 | ...Long traverse stroke (e.g., wrap wind)  |
| 475.7 | ..Including positioning of material outer end on wound package             | 478.5 | ....Guide stroke limit shifted along package   |
| 475.8 | ..Including outer end and removal and repositioning on package             | 478.6 | ...Short traverse stroke shifted along package (e.g., weft wind)                             |
| 475.9 | ...Inserting material end within package                                   | 478.7 | ....Including forming an initial reserve coil  |
| 476   | ..Material outer end removed from package                                  | 478.8 | .....By control of traverse  |
| 476.1 | ..Including particular material to spool connection                        | 478.9 | .....By use of auxiliary cam   |
| 476.2 | ..By separate preliminary wind   | 479   | .....Including varying rate of shifting of stroke limits                                     |
| 476.3 | ...Preliminary wind overwraps material end                                 | 479.1 | .....Including varying of stroke length  |
| 476.4 | ...Prior to material introduction to traverse guide                        | 479.2 | ..By progressive shifting of constant traverse stroke  |
|       |  | 479.3 | ...Long traverse stroke (e.g., bobbin tapered at both ends)                                  |



- 479.4 ....On bobbin having cylindrical and frusto-conical portions
- 479.5 ...Short traverse stroke
- 479.6 ....Guide stroke moves progressively along axially stationary package
- 479.7 .....Having progression roller engaging package periphery
- 479.8 ....Including formation of an initial reserve coil
- 479.9 ....Including material controlled stop
- 480 .....Break or exhaust responsive
- 480.1 .....Wound material sensor
- 480.2 ....Forming plural wound packages
- 480.3 ....Including particular presser or shaper for package as it is wound
- 480.4 ..Progressive variation of guide stroke length (e.g., at least one end of package tapered)
- 480.5 ...By lever guided in inclined rail
- 480.6 ...By lever having variable pivot
- 480.7 ...On double-headed spool
- 480.8 ..Manually adjustable traverse
- 480.9 ..Servo-driven guide following moving pattern
- 481 ..Using fluid (fluid motor or direct fluid action)
- 481.1 ...By pneumatic jet distributor
- 481.2 ..Using magnetic device
- 481.3 ..Endless loop mechanism
- 481.4 ...Single guide on endless loop
- 481.5 ....Guide strikes material from opposite sides
- 481.6 ...Counter moving guides (e.g., pins) striking material
- 481.7 ..Counter moving guides (e.g., pins) striking material
- 481.8 ..By cam engaging material
- 481.9 ...Cam is grooved material-receiving spool
- 482 ...Including auxiliary structure for guiding material across cam groove intersection
- 482.1 ...Including auxiliary structure for preventing material from moving beyond ends of grooved cam
- 482.2 ...Wear-resistant groove structure
- 482.3 ...Split drum
- 482.4 ..Guide driven by cam and follower
- 482.5 ...Rotatable guide following stationary cam (e.g., guide on nut on threaded shaft)
- 482.6 ...Driven by cam-contacting lever
- 482.7 ....Adjustable throw lever
- 482.8 ...Rotary cam and linearly shifted follower
- 482.9 ....Threaded cam
- 483 .....Grooved spool and follower
- 483.1 .....Threaded cams with split nut cam followers
- 483.2 .....Having electrical switching device
- 483.3 .....Having reversible cam drive
- 483.4 .....Alternately engageable drives (e.g., alternately operated clutches)
- 483.5 .....Reversely threaded (i.e., cam having opposite threads)
- 483.6 .....Having irregularly threaded portion (e.g., forming tapered package)
- 483.7 ....Details of follower
- 483.8 ..Guide driven by rotating crank or eccentric
- 483.9 ..Guide on driven oscillating lever
- 484 ..By shifting spool
- 484.1 ...Cam shifting mechanism
- 484.2 ..Self traversing (i.e., guide moved by material)
- 484.3 ...Toggling guide bar
- 484.4 ...Follower engaging wound material
- 484.5 ..Traverse drive motor mounted on guide
- 484.6 ..Including particular drive
- 484.7 ..Associated with sewing machine drive for forming wound package for sewing machine shuttle
- 484.8 ...Having material controlled stop
- 484.9 ..Having winding state-controlled stop
- 485 ...Running material sensor
- 485.1 ....Having take-up package sensor
- 485.2 ....Break or exhaust responsive (absence of material)
- 485.3 .....Separating wound package from peripheral drive drum or roll
- 485.4 ....Thickness variation responsive
- 485.5 ....Material length responsive

485.6	...Wound material sensor	526	..Transverse cutting
485.7	....Coil (package) diameter responsive	526.1	...Perforating or notching
485.8	.....Separating wound package from peripheral drive drum or roll	526.2	...With winding of flexible cutter
485.9	..Peripheral drive	526.3	...Special end forming (e.g., tapering)
486	...And driven spindle	527	...Knife shiftable to sever material
486.1	...Including details of take-up-contacting drive	527.1	....Within roller
486.2	...Particular holder or support for spool or wound package	527.2	....Cut adjacent to new core
486.3	...Including speed control	527.3	.....Arcuately shiftable cutter
486.4	...Including drive pressure regulator	527.4	.....With anvil or cooperating cutter
486.5	...Manual	527.5	....Edge-to-edge (e.g., scissor type)
486.6	..Particular drive motor or motor structure	527.6	.....Rotary disk
486.7	..Including speed control	527.7	.....With reactive surface (e.g., anvil)
486.8	..Drive engages spindle	528	.Of discrete sheets or articles
486.9	...Manual	529	.Contracting or expanding spool during winding
487	..Manual	530	.Simultaneous winding
487.1	..And severing	530.1	..Coaxial coils
487.2	..Tension variation responsive	530.2	...Superposed coils
487.3	..Material defect responsive	530.3	...Relatively rotatable coils
487.4	..Coil diameter responsive	530.4	...Multiple coil groups
487.5	..Material length responsive	531	.Sequential winding stations
487.6	..Severing proximate to spool	531.1	..With transitional guide
487.7	..Particular severing device	532	.With particular material connection to take-up
487.8	...Bladeless	532.1	..To take-up leader
487.9	...Multiple blades	532.2	..Pneumatic assist
488	...Blade and coacting anvil	532.3	..Bonded (e.g., adhesive or water)
520	<b>CONVOLUTE WINDING OF MATERIAL</b>	532.4	..Material pierced by take-up component
521	.With tearing or breaking	532.5	..Clamp on take-up
522	.With cutting, perforating, or notching	532.6	..Slotted take-up
523	..Automated control	532.7	..With particular threading facility
523.1	...For transverse cutting	533	.With spool loading or coil removal
524	..Sequential cutting stations	533.1	..With particular spool supply hopper
524.1	...Longitudinal and transverse severing	533.2	..Pivotal transfer device
525	..Longitudinal cutting	533.3	...Peripheral coil support
525.1	...Positionally related slitte and winding surface	533.4	...Turret
525.2	....Slitter engages winding surface	533.5	...With particular turret indexer
525.3	...Includes nonwound strip (e.g., trimming)	533.6	....With particular winding drive
525.4	...Perforating	533.7	..Axially shifted transfer device
525.5	...With particular slitte adjustment	533.8	..Mobile carrier (e.g., wheeled vehicle)
525.6	...By rotary slitte disk		
525.7	....With reactive material support surface		

534	..Detector, control, or material responsive stop	548.2	..Edge of running web
534.1	..Responsive to material path	548.3	..Proximate coil end
534.2	..Responsive to material length	548.4	...Noncontacting (e.g., magnetic or air)
535	..With feeder	550	<b>UNWINDING</b>
535.1	..Deflecting material into coil (e.g., coreless coiling)	551	..With attachment to preceding material
535.2	..Variable or intermittent	552	..With accumulator
535.3	..Driven with take-up or supply	553	..With lead end modification (e.g., trimming)
535.4	..Endless belt or chain	554	..With automated control
535.5	..Special surface (e.g., toothed)	554.1	...Material registration
536	..Winding spaced-apart convolutions	554.2	...Cutting
537	..Irregularly shaped take-up	554.3	...Turret indexing control
538	..With coiled supply	554.4	...Differentiated material portion (e.g., material end, tear, or signal)
538.1	..Coordinated drive of supply and take-up coils	554.5	...Drive or brake control
538.2	..With intermediate access station	554.6	....Speed matching (e.g., new roll to running material)
538.3	...Enclosed housing for coils	555	..Splicing running material (i.e., flying splice)
538.4	..Light occludent construction (e.g., light sensitive film holder)	555.1	...Shift new material
539	..With particular frame	555.2	....Longitudinal shift
540	..With particular drive	555.3	...Between new roll and expiring material
541	..Driver engages coil periphery	555.4	....Stationary roll positions
541.1	...With spindle driver	555.5	....Turret support for new roll
541.2	...Coreless	555.6	.....With particular splicer
541.3	...Endless belt driver	555.7	.....With peripheral drive
541.4	...With drive pressure regulator (e.g., nip pressure control)	556	..With particular splice means (e.g., glue or pressure)
541.5	....Coil engaging pressure element	556.1	...Adhesive tape
541.6	.....Fluid actuator	557	..Mobile unwinding station (e.g., wheeled conveyance)
541.7	....Fluid actuator	558	..With supply coil replenishment
542	...Plural drums	559	..Supply coil transfer apparatus
542.1	....Driven at different speeds	559.1	...Arcuate transfer path
542.2	....Shiftable drum	559.2	....By indexed turret
542.3	...With core steering means (e.g., pivotal mounting or guide rail)	559.3	...Sequential coil shifting
542.4	...Particular drum	559.4	...Coil vertically positioned
543	..Intermittent	560	..Reserve coil storage
544	..Variable speed	560.1	...With feeder from subsequent supply
545	..With clutch or releasable coupling	560.2	...Manually shifted reserve coil
545.1	...Limited torque	560.3	....Radially shifted
546	..With particular drive input	561	..Static ramp or track
546.1	...Manual	562	..With material end separator (e.g., doctor blade or jet)
547	..Pressure element against coil (e.g., nip pressure member)	562.1	..With threading along unwinding path
548	..With particular material guide or guard	563	..With detector, indicator, or control
548.1	..Distributing		

563.1	..Unwinding path (e.g., material alignment)	577	..Individually adjustable segment or spoke
563.2	..Material length	577.1	...Yieldable
564	..With drive mechanism	577.2	...Variable spoke alignments
564.1	..Limited interval	577.3	...Bodily retractable spoke
564.2	...Manual crank or lever	577.4	...Linearly shiftable winding surface
564.3	..Feeder spaced from coil	578	..Axially adjustable
564.4	...Roller or sprocket	578.1	..Threaded operator
564.5	..Coil engaging driver	578.2	..Discrete adjustment positions
565	..With unwinding limit	578.3	..Yieldable coil support
566	..With particular guide or guard	579	..With material end retainer
570	<b>COIL HOLDER OR SUPPORT (E.G., SPINDLE, DISPENSER, OR SPOOL)</b>	580	..Outer end
571	..Radially expansible or contractile	580.1	...Edge grip or barrier pair for strip material
571.1	..Inflatable bladder	581	..With attractor (e.g., magnet or vacuum)
571.2	...Plural	582	..Preattached flexible leader
571.3	..Spool loading responsive	583	..Adhesive or hook-and-pile fabric
571.4	...Compressible or deflectable	584	..Material penetrating (e.g., piercing)
571.5	....Longitudinal rib	584.1	...Projection for preformed material opening
571.6	..Rotation responsive	585	..Edge grip pair for strip material
571.7	...Wedging roller or ball	586	..Clamp
571.8	..Axially compressed elastic mass	586.1	...Threaded or cam operator
572	..Longitudinally shiftable operator	586.2	...Separable from coil holder
573	...Cam and follower	586.3	...Bodily displaced
573.1	....Surface wedge	586.4	...Pivoted
573.2	....Longitudinally spaced cams	586.5	....About winding or parallel axis
573.3	.....Opposed	586.6	....Resilient
573.4	.....Separable (i.e., opposed stubs)	587	..Apertured
573.5	.....Threaded operator	587.1	...Coacting with material fitting or modification
573.6	.....Reverse thread helices	587.2	...Slot
573.7	.....Free end spindle	587.3	....With special access
573.8	.....Radial wedge separates mandrel segments	588	..Randomly oriented coil holder (e.g., portable)
573.9	....Free end spindle	588.1	..With hand or body attachment
574	...Shiftable linkage	588.2	..With distinct hand grip
574.1	....Parallelogram	588.3	..Dispensing container
574.2	....Mutually pivoted (e.g., lazy tong type)	588.4	...Unitary folded blank
574.3	....Trapezoidal	588.5	...Light occludent construction
574.4	....Center actuated, pivoted linkage (e.g., umbrella type)	588.6	...With coil supporting hub
575	..Transversely shiftable operator	590	..Mounted coil holder or spindle (e.g., dispenser or mandrel)
575.1	...Split band spreader	591	..Discrete coil positions
575.2	...Geared segment	592	..Infinitely variable coil positions
575.3	...Rotatable cam or cam follower	593	..Axial material delivery
575.4	....Hinged mandrel segment		
575.5	...Shiftable linkage		
576	..With particular actuator or contractor		
576.1	...Fluid		

594	..Simultaneously available supplies	602	..With convolution or layer separator
594.1	...Peripherally supported coil	602.1	...Helical pattern
594.2	....Coaxial	602.2	....With particular lead-in or crossover structure
594.3	...Coaxial coils	602.3	...Spiral groove (e.g., convolute divider)
594.4	....Plural rows or array	603	..With multiple coiling areas
594.5	...Row	604	..Openwork
594.6	....Plural rows or array	604.1	...Wire hub and flange
595	..Peripheral coil support	605	..Stackable
595.1	...Roller or endless belt	606	..With single or dominant flange
596	..Opposed stub spindles	607	..Particular component connection
596.1	...Spindle on retractable frame arm	607.1	...Hinged or slidable for collapsing
596.2	....With latch connecting spindles	607.2	...Convertible assembly
596.3	....Pivoted or deflected frame arm	608	...Flange to hub or another flange
596.4	...Retractable spindle	608.1	....Flange rotatable on hub
596.5	....With actuator to retract spindle	608.2	....Mechanical joint or fastener
596.6	.....Helical cam or threaded actuator	608.3	.....Discrete fastener (e.g., rivet or staple)
596.7	...Particular spindle formation	608.4	.....Threaded (e.g., bolt or screw)
596.8	...Particular frame formation	608.5	....Rotatable joint (e.g., threaded or bayonet fit)
597	..Free end spindle support (e.g., cantilever)	608.6	.....Snap fit
597.1	...With releasable coil retainer	608.7	.....Bendable tab or crimp
597.2	....Spool forms retainer part	608.8	....Bonded (e.g., welded or cemented)
597.3	....Radially deflectable retainer	609	...Hub components
597.4	....Removable retainer	609.1	....Mechanical joint or fastener
597.5	...Particular spindle formation	609.2	.....Threaded fastener (e.g., bolt or screw)
597.6	....Spindle-to-spool bearing or coupling	609.3	....Rotatable joint (e.g., threaded or bayonet fit)
597.7	...Vertical	609.4	....Bonded (e.g., welded or cemented)
597.8	...Particular frame formation	610	..Particular material or material treatment
598	..Spindle disposed between supports	610.1	...Sheet stock
598.1	...Frame with shiftable arm	610.2	....Foldable unitary blank
598.2	...Frame with pivoted spindle	610.3	....Crimped or hemmed
598.3	...Frame with removable spindle	610.4	...Diverse materials
598.4	....Shiftable spindle retainer	610.5	...Metal
598.5	...Particular frame formation	610.6	...Plastic, rubber, or ceramic
598.6	....Coil enclosure	611	..With brake or drive formation
599	...Spindle feature	611.1	...Circular rim (e.g., drum, sprocket, or ratchet)
599.1	....Telescoping or meshing surfaces	611.2	...Noncircular bore (e.g., spline)
599.2	....Spaced coil retaining or supporting portions	612	..With particular bearing formation
599.3	....Spindle-to-frame bearing or coupling		
599.4	....Spindle-to-spool bearing or coupling		
600	..Spool or core		
601	..With cover		

613	..Particular hub or core formation	129.71	..With retainer-spindle
613.1	...Irregularly shaped (e.g., tapered)	129.72	..With guide(s)
613.2	....Cross sectionally	129.8	.With brake for holder and/or strand
613.3	.....Flattened (e.g., card)	130	.For bobbins (i.e., commercial-type strand packages)
613.4	...Reinforcement feature	130.1	..With spindle modified for conical bobbin
613.5	....Flangeless core	130.2	..Vertically suspended spindle
614	..Flange feature	130.3	..Pinboard (i.e., bobbin-storage tray)
614.1	...Reinforcement	130.4	..Skewer
615	<b>MATERIAL GUIDE OR GUARD</b>	131	..Creel
615.1	.Variable guide path	131.1	...Warp type
615.11	.Fluid suspension	132	..Receptacle or trough
615.12	..Turning guide	134	.For a spool (i.e., domestic-type strand package)
615.2	.Rotatable	136	..Carrier attachment
615.21	.Angled turning guide for a web	137	..Receptacle
615.3	.With material confining portion	137.1	...With guide eye
615.4	.With particular guide surface formation or treatment	138	...Single spool
118	<b>BOBBIN OR SPOOL</b>	139	..Stand
118.1	.Open-work structure	140	..Thread guard or guide
118.11	..Resilient	141	.For twine
118.2	.Resilient	146	..Receptacle
118.3	.Cop-tube type (i.e., headless or single-headed tube)	147 R	<b>STRAND TENSIONING DEVICE</b>
118.31	..Reinforcing feature	147 A	.Air
118.32	..Tube material feature	147 M	.Magnet
118.4	.Double-headed spool	148	.Alarm or indicator
118.41	..Plural spools axially connected	149	.Clamp
118.5	..Head(s) adjustable along axis	150 R	..Disk type
118.6	..Head connections (e.g., bolted)	150 M	...Magnetic
118.61	...Inserted head joint	151	..Roller
118.62	....Screw connection(s)	152	...Fluted
118.7	..Spool material feature	152.1	..Ball
118.8	...Sheet stock	153	.Tortuous course
125	.Thread fastener or guide	154	..Adjustable
125.1	..Strand end attacher	155 R	.Wheel or pulley
125.2	...Outer end	155 M	..Magnetic
125.3	....Permits unwinding	155 BW	..Bull wheel
127	<b>SKEIN HOLDER</b>	156	.Brake
128	<b>STRAND UNWINDING DEVICE</b>	156.1	..Peripheral, on material itself
129	<b>HOLDER FOR COILED STRAND</b>	156.2	..Automatic, on disc other than spool
129.1	<b>STRAND TAKE-UP DEVICE</b>	157 R	<b>STRAND GUIDE</b>
129.2	.Lever type	157.1	.Oscillatable or reciprocable
129.3	.Rewind type	157 C	.Pig tail
129.4	.Counterweight type	222	<b>CARD, BOARD, OR FORM</b>
129.5	<b>SUPPORT FOR A STRAND MATERIAL HOLDER</b>	899	<b>MISCELLANEOUS</b>
129.51	.Opposed stub-shafts		
129.53	..With guide(s)		
129.6	.Shaft supported at both ends		
129.62	..With guide(s)		
129.7	.With axial-position retainer for holder		

**CROSS-REFERENCE ART COLLECTIONS**

900 **PARTICULAR APPARATUS MATERIAL**  
 901 **FIGURE EIGHT WINDING**  
 902 **LINE LOADER FOR FISHING REEL**  
 903 **DRUM FOR A WINCH OR HOIST**  
 904 **WATER SKI REEL**  
 905 **WINDER WITH STORAGE CHAMBER**  
     **(E.G., FOR DEODORANT, PAPER,**  
     **ETC.)**  
 906 **STATIC CHARGER OR DISCHARGER**  
 907 **VIBRATION CREATION OR DAMPENING**  
 908 **FLUID TREATMENT OR HANDLING**  
 909 **HEATING OR COOLING**  
 910 **CONVOLUTION TIGHTENER OR LOOSENER**  
 911 **CUTTER**  
 912 **INDICATOR OR ALARM**  
 913 **SAFETY DEVICE**  
 914 **SPECIAL BEARING OR LUBRICATION**  
 915 **COIL GRIPPER**  
 916 **HAND TOOL**  
 917 **ACCOMODATING SPECIAL MATERIAL OR**  
     **ARTICLE (E.G., ANTENNA)**  
 918 **.Web material (e.g., thermal**  
     **insulation)**  
 919 **..Ground cover (e.g., tarp)**  
 920 **GLASS STRAND WINDING**

# FOREIGN ART COLLECTIONS

## FOR 000 CLASS-RELATED FOREIGN DOCUMENTS

Any foreign patents or non-patent literature from subclasses that have been reclassified have been transferred directly to FOR Collections listed below. These Collections contain ONLY foreign patents or non-patent literature. The parenthetical references in the Collection titles refer to the abolished subclasses from which these Collections were derived.

FOR 100 **SPOOLER (242/16)**  
 FOR 101 **.Multiple (242/17)**  
 FOR 102 **BOBBIN OR COP WINDING (242/18 R)**  
 FOR 103 **.Ribbon breaker (i.e., means to**  
     **prevent coil crowding) (242/**  
     **18.1)**  
 FOR 104 **.Cutting device (242/19)**  
 FOR 105 **.Sewing machine shuttle (242/20)**  
 FOR 106 **..Cutting device (242/21)**  
 FOR 107 **..Stop (242/22)**  
 FOR 108 **..Disk type (242/23)**  
 FOR 109 **..Thread presser or pad (242/24)**

FOR 110 **.Wire (242/25 R)**  
 FOR 111 **..Alternate or successive wind**  
     **(242/25 A)**  
 FOR 112 **.Symmetrical layers (242/26)**  
 FOR 113 **.Building mechanism (e.g., ring-**  
     **rail type) (242/26.1)**  
 FOR 114 **..Wrap wind (i.e., full-traverse**  
     **mechanism) (242/26.2)**  
 FOR 115 **...Means to vary traverse**  
     **mechanism (242/26.3)**  
 FOR 116 **..Weft wind (i.e., short-traverse**  
     **mechanism) (242/26.4)**  
 FOR 117 **...Preliminary or bunch winders**  
     **(242/26.41)**  
 FOR 118 **....By auxiliary cam means (242/**  
     **26.42)**  
 FOR 119 **....By traverse controlling means**  
     **(242/26.43)**  
 FOR 120 **.....With means to control gain**  
     **mechanism (242/26.44)**  
 FOR 121 **...Means to vary service traverse**  
     **or gain (242/26.45)**  
 FOR 122 **.Full traverse mechanism shifted**  
     **in one direction (242/26.5)**  
 FOR 123 **.Cone wind (242/27)**  
 FOR 124 **..Preliminary or bunch winder**  
     **(242/27.1)**  
 FOR 125 **..detector or stop (242/28)**  
 FOR 126 **...Thread break or exhaust (242/**  
     **29)**  
 FOR 127 **...Load (242/30)**  
 FOR 128 **..Quick traverse (242/31)**  
 FOR 129 **..Multiple (242/32)**  
 FOR 130 **..Presser or shaper (242/34)**  
 FOR 131 **..Spindle or appurtenance (242/**  
     **35)**  
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     **empty bobbins (242/35.5 A)**  
 FOR 134 **..Turret type (242/35.5 T)**  
 FOR 135 **.Reserve thread uniting (242/35.6**  
     **R)**  
 FOR 136 **..End finder (242/35.6 E)**  
 FOR 137 **.Detector or stop (242/36)**  
 FOR 138 **..Thread break or exhaust (242/37**  
     **R)**  
 FOR 139 **...Knotter (242/37 A)**  
 FOR 140 **...Doubling machine (242/38)**  
 FOR 141 **..Load (242/39)**  
 FOR 142 **...Doubling machine (242/40)**  
 FOR 143 **.Ejector (242/41)**  
 FOR 144 **.Doubling machine (242/42)**  
 FOR 145 **.Quick traverse (242/43 R)**

FOR 146 ..By means to vary traverse mechanism (242/43.1)  
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 FOR 150 ..Magnetic (242/43 M)  
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 FOR 186 ..Heddle or seine needle (242/51)  
 FOR 187 ..Tatting shuttle (242/52)  
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 FOR 196 ..Belt chain traverse (242/158 B)  
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#### DIGESTS

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 DIG 2 **NARROW FABRIC WINDING APPARATUS**  
 DIG 3 **CORELESS COILERS**